

WHAT IS CLAIMED IS:

1. An integrated x-ray image capture and readout system, comprising:

a cassette enclosure having a form factor corresponding to a standard radiographic

5 film cassette;

a storage-phosphor plate operable to capture incident x-rays corresponding to an
image;

a stimulating light source operable to expose a surface of the storage-phosphor plate
to stimulating light;

10 an array of detectors positioned to receive stimulated light via the surface of the
storage-phosphor plate, the stimulated light being released from the storage-phosphor plate
in response to the stimulating light; and

an actuator assembly operable to effect relative motion between the surface of the
storage-phosphor plate and each of the stimulating light source and the array of detectors in

15 one dimension;

wherein the storage-phosphor plate, the stimulating light source, the array of
detectors, and the actuator assembly are enclosed in the cassette enclosure.

2. The system of claim 1 further comprising an actuator driver positioned

20 externally to the cassette enclosure and operationally coupled to the actuator assembly via a
mechanical link.

3. The system of claim 2 wherein the actuator driver is coupled directly to the
cassette enclosure.

4. The system of claim 2 wherein the actuator driver is separate from the cassette enclosure.

5. The system of claim 2 wherein the mechanical link connects the actuator driver and the actuator assembly via an aperture at a corner of the cassette enclosure.

6. The system of claim 5 wherein the mechanical link forms a 135 degree angle with each of two edges of the cassette enclosure joined at the corner.

10 7. The system of claim 5 wherein the mechanical link is hinged at the corner of the cassette enclosure to allow at least lateral movement of the mechanical link.

8. The system of claim 2 wherein the array of detectors is operable to convert the stimulated light to electronic data corresponding to the image, the system further comprising a transmission medium for transmitting the electronic data out of the cassette enclosure, the transmission medium exiting the cassette enclosure via the aperture.

9. The system of claim 1 wherein the actuator assembly is disposed along an edge of the cassette enclosure to maximize an imaging area of the storage-phosphor plate.

20

10. The system of claim 1 wherein at least a portion of the actuator assembly comprises a radiolucent material.

11. The system of claim 1 wherein the actuator assembly comprises one of a lead screw, a belt, a magnetic linear motor, and an inchworm motor.

25

12. The system of claim 1 wherein the array of detectors is operable to convert the stimulated light to electronic data corresponding to the image, the system further comprising a transmission medium for transmitting the electronic data out of the cassette enclosure.

13. The system of claim 1 further comprising a radio frequency detector for detecting radio frequency energy in close proximity to the cassette enclosure, the radio frequency energy corresponding to patient information to be associated with the image.

14. The system of claim 13 further comprising a radio frequency transmitter disposed outside of the cassette enclosure for generating the radio frequency energy.

15. The system of claim 14 wherein the radio frequency transmitter is included in one of a wrist band and a badge.

16. The system of claim 1 further comprising an image capture detection circuitry for sensing whether capture of the incident x-rays is occurring and generating a signal indicative thereof.

17. The system of claim 16 wherein the image capture detection circuitry comprises an x-ray detector for detecting some of the incident x-rays.

18. The system of claim 16 wherein the image capture detection circuitry comprises a photodiode for detection prompt emission of the storage-phosphor plate in response to the incident x-rays.

5 19. The system of claim 16 wherein the signal is employed to control actuation of the actuator assembly.

20. The system of claim 1 wherein the actuator assembly comprises a magnetic linear motor and the stimulating light source and the array of detectors are configured on a
10 translation stage.

21. The system of claim 20 wherein the magnetic linear motor comprises at least one magnet disposed inside and along an edge of the cassette enclosure, and a linear motor actuator coupled to the translation stage.

15 22. The system of claim 1 wherein the form factor of the cassette enclosure corresponds to a standard radiographic film cassette having a set of dimensions corresponding to one of 14" x 17", 14" x 14", 10" x 12", 8" x 10", 35 cm x 43 cm, 35 cm x 35 cm, 20 cm x 40 cm, 18 cm x 43 cm, 13 cm x 18 cm, 13 cm x 30 cm, 18 cm x 24 cm, and
20 24 cm x 30 cm.